



US009079631B1

(12) **United States Patent**  
**Costa**

(10) **Patent No.:** **US 9,079,631 B1**  
(45) **Date of Patent:** **Jul. 14, 2015**

(54) **MOTORCYCLE FORK ADAPTER**

(56) **References Cited**

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(US)

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(72) Inventor: **Vincenzo Costa**, Newport Beach, CA  
(US)

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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*Primary Examiner* — Kevin Hurley

(21) Appl. No.: **14/506,905**

(74) *Attorney, Agent, or Firm* — Clement Cheng

(22) Filed: **Oct. 6, 2014**

(57) **ABSTRACT**

**Related U.S. Application Data**

(60) Provisional application No. 62/037,008, filed on Aug. 13, 2014.

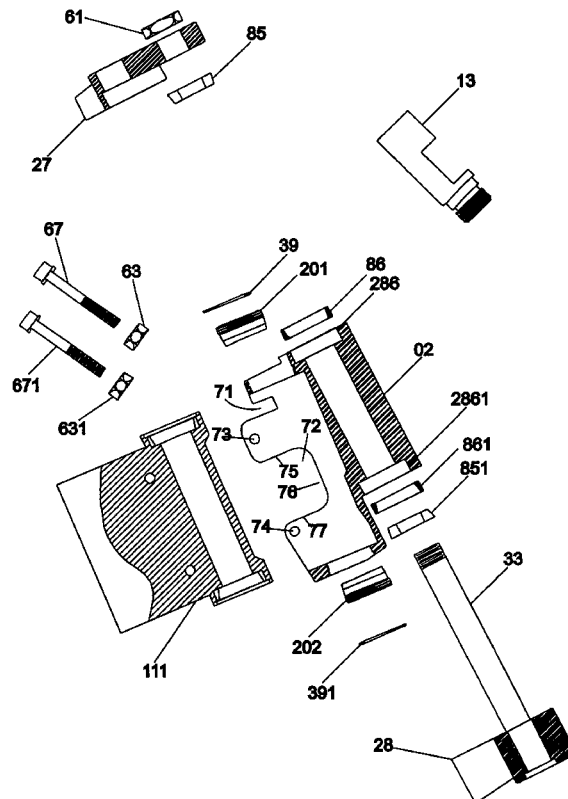
(51) **Int. Cl.**  
**B62K 25/00** (2006.01)  
**B62K 21/22** (2006.01)  
**B62K 21/04** (2006.01)

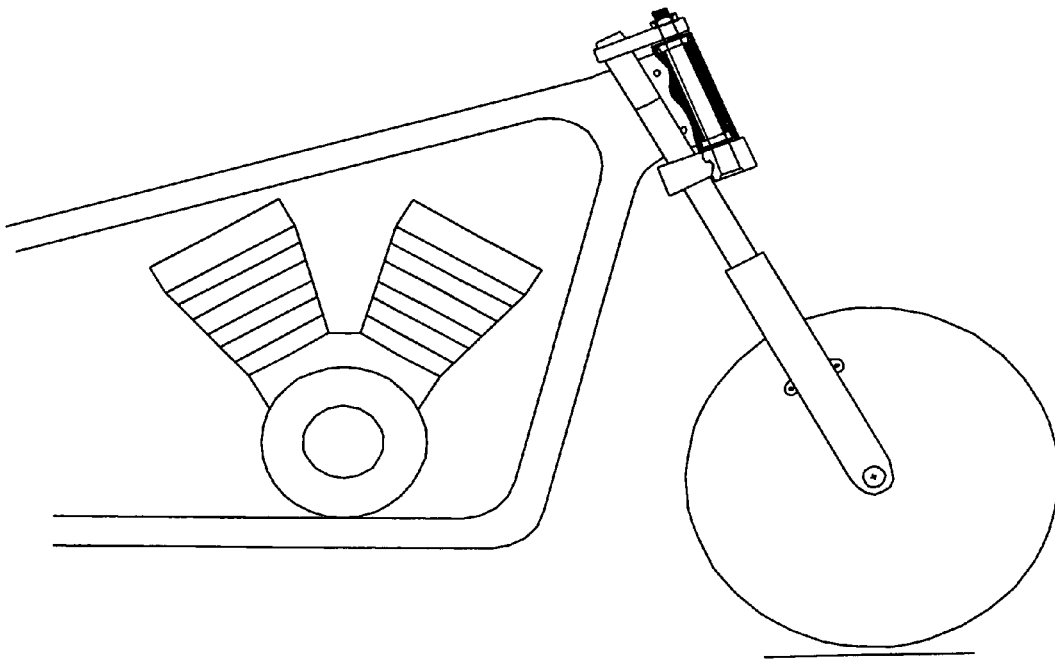
(52) **U.S. Cl.**  
CPC ..... **B62K 21/22** (2013.01); **B62K 21/04**  
(2013.01)

(58) **Field of Classification Search**  
CPC ..... B62K 21/04; B62K 21/22  
See application file for complete search history.

A motorcycle neck adapter comprising a main body formed of a single piece of metal, and a cavity socket formed on an aft end of the main body. The cavity socket is configured to receive an existing motorcycle neck. An upper set screw opening is formed on a top surface of the main body. An upper set screw is installed into the upper set screw opening. The upper set screw is configured to engage an existing motorcycle neck at an existing motorcycle steering neck top opening. The upper set screw is secured to the upper set screw opening by a threaded connection. A lower set screw opening is formed on a bottom surface of the main body. A lower set screw is installed into the lower set screw opening.

**13 Claims, 14 Drawing Sheets**





**Fig. 1 (Prior Art)**

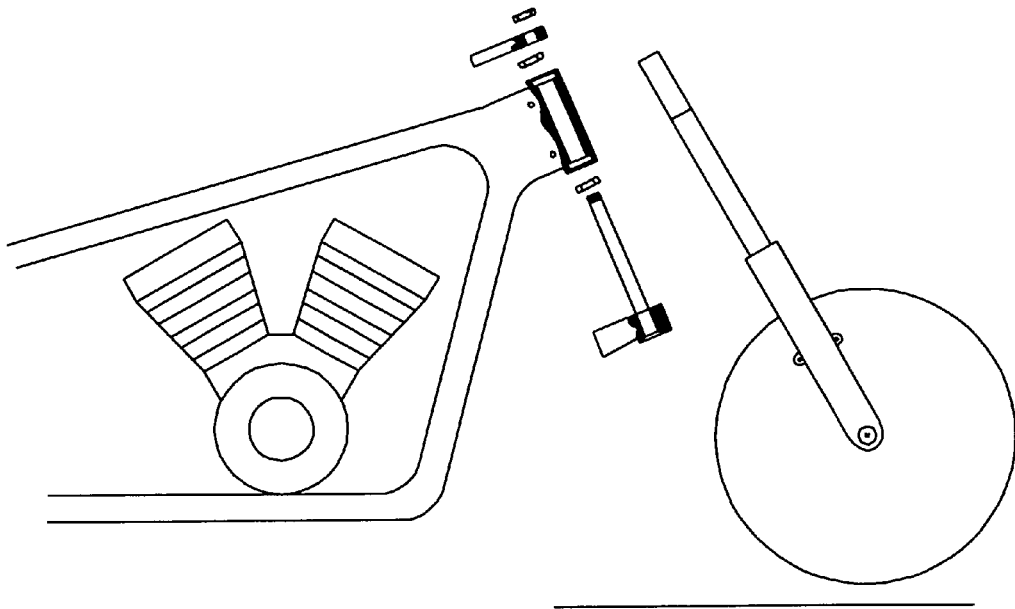


Fig. 2 (Prior Art)

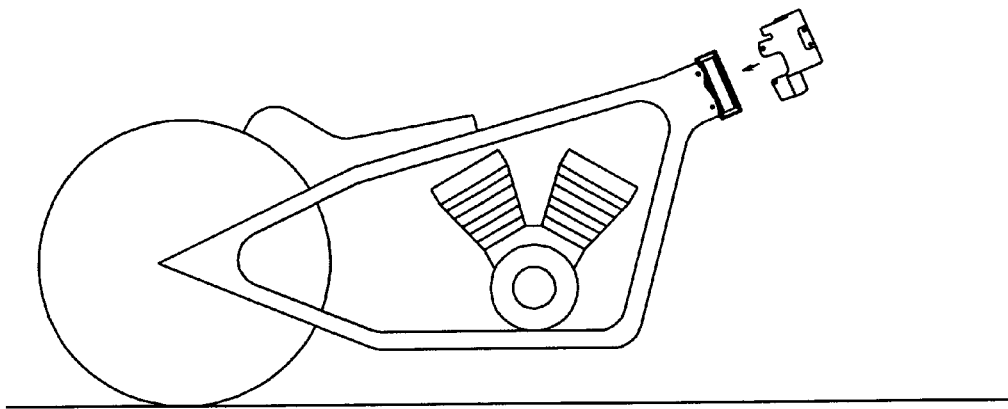


Fig. 3

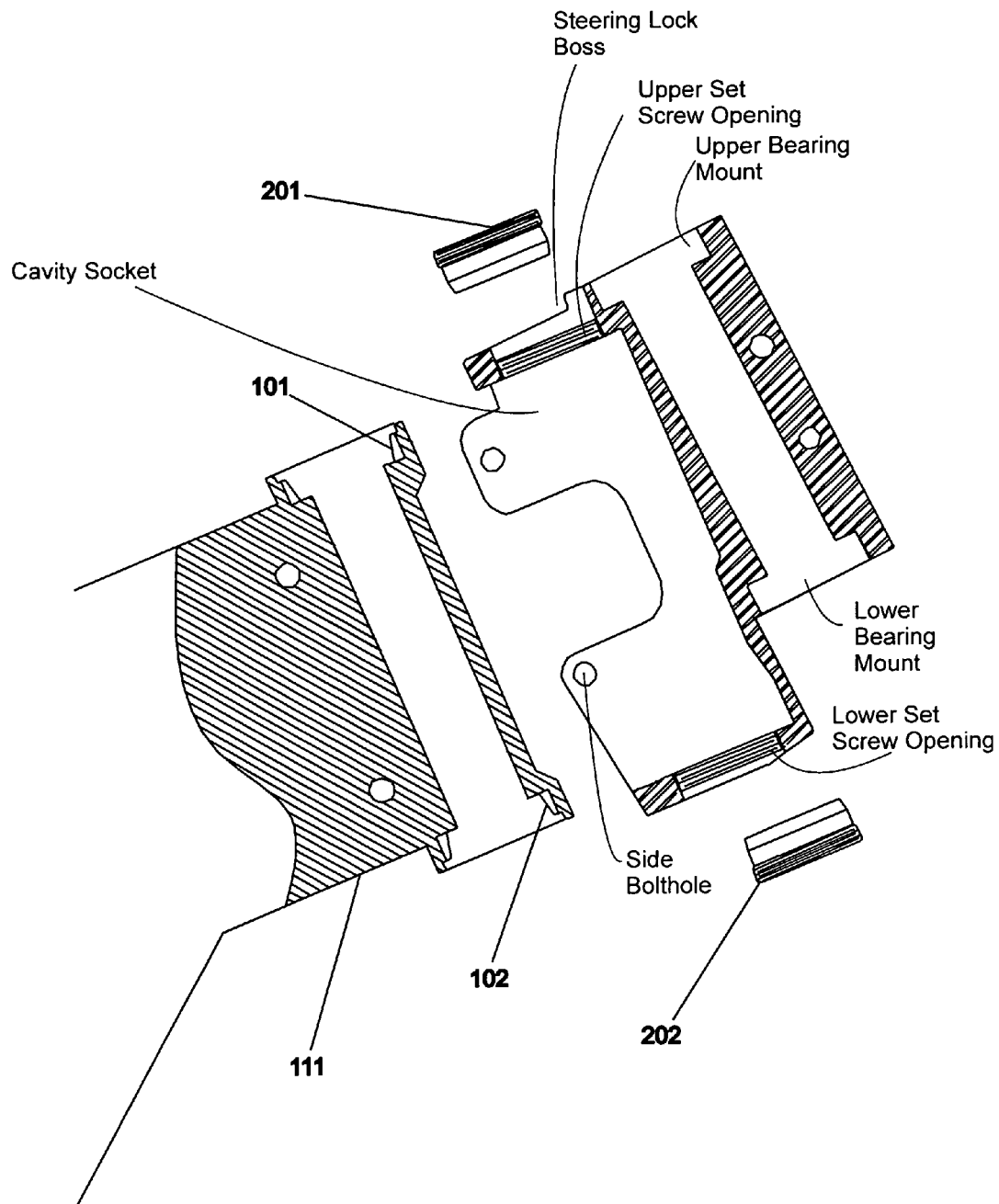


Fig. 4

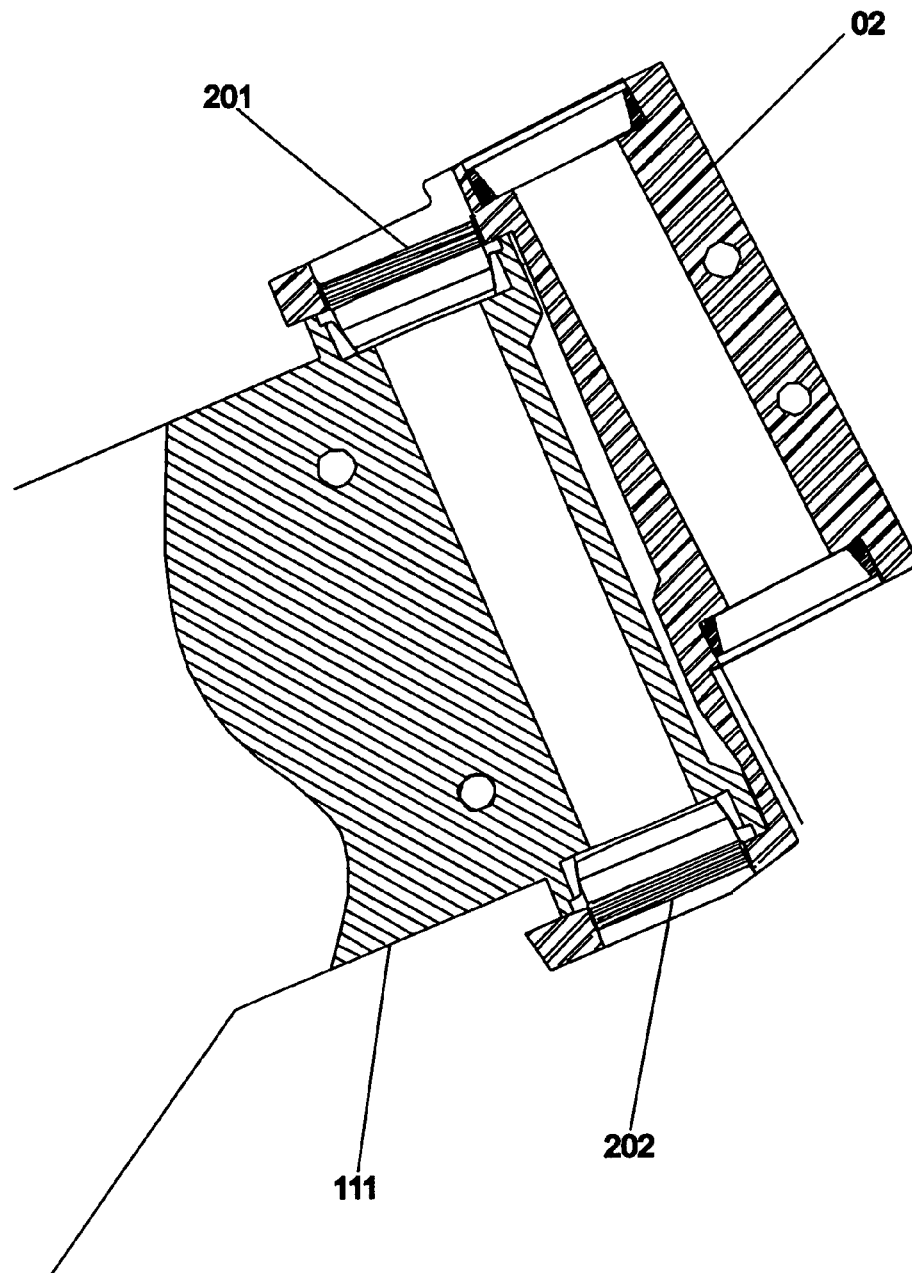


Fig. 5

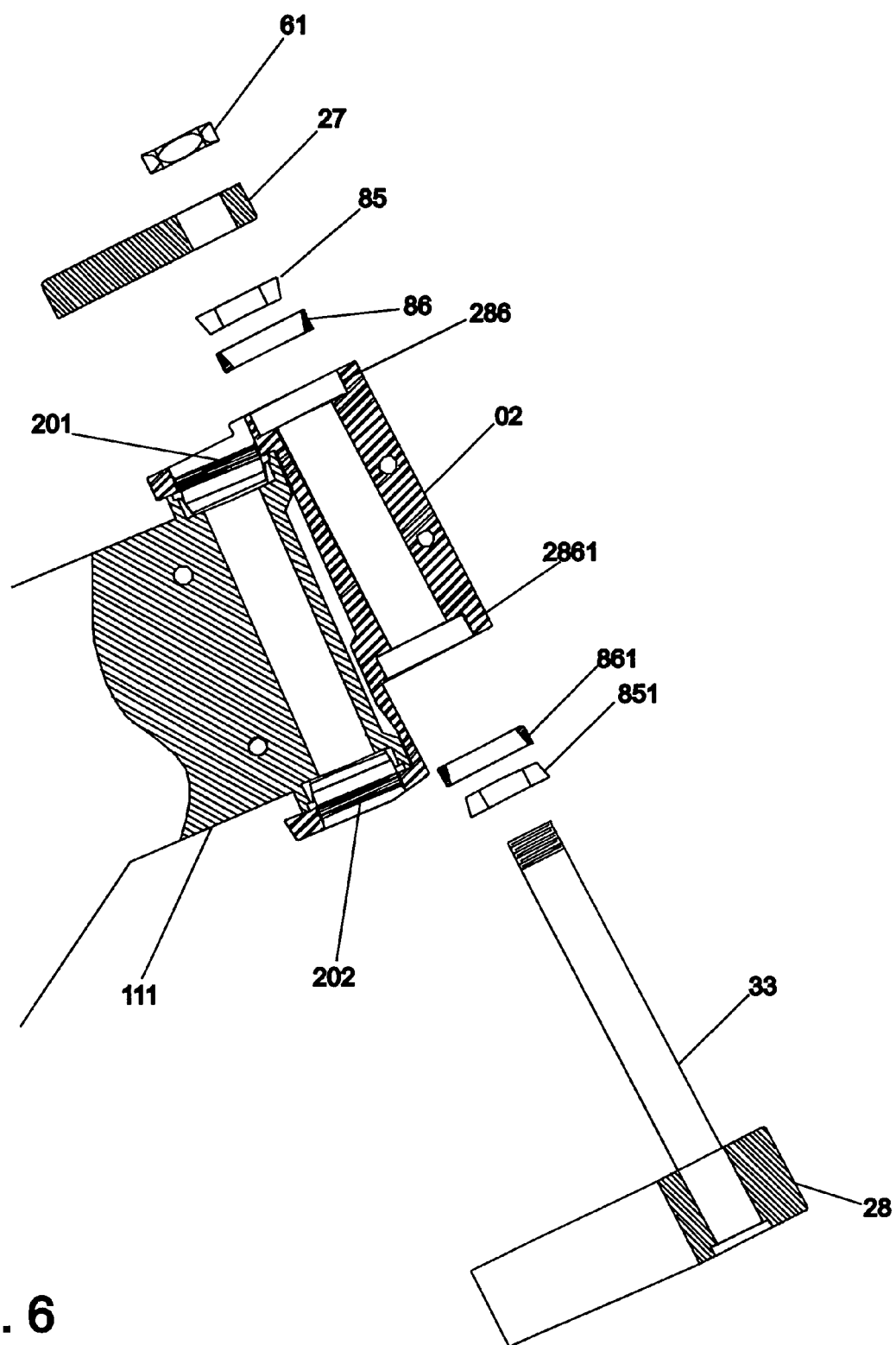
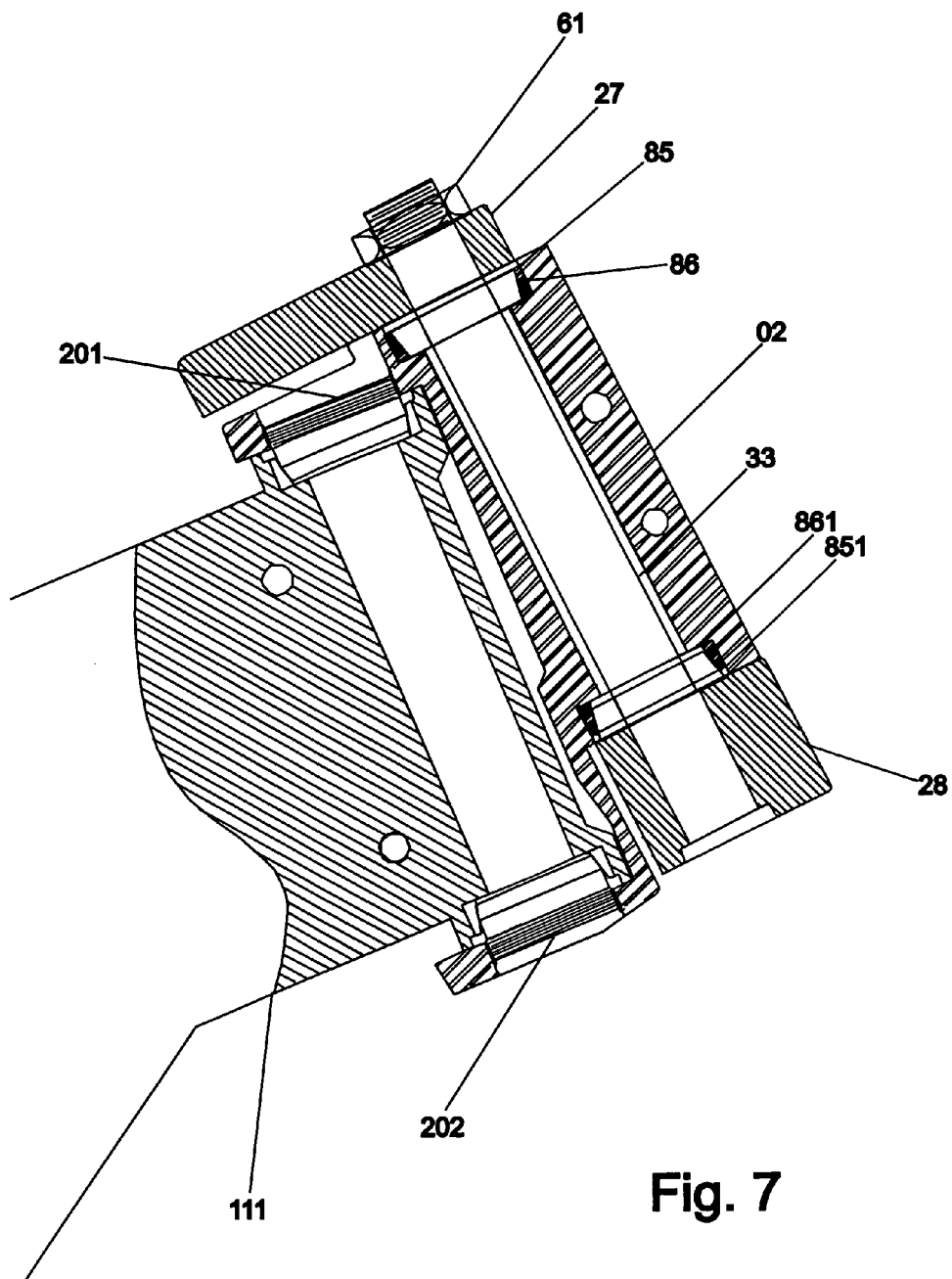


Fig. 6





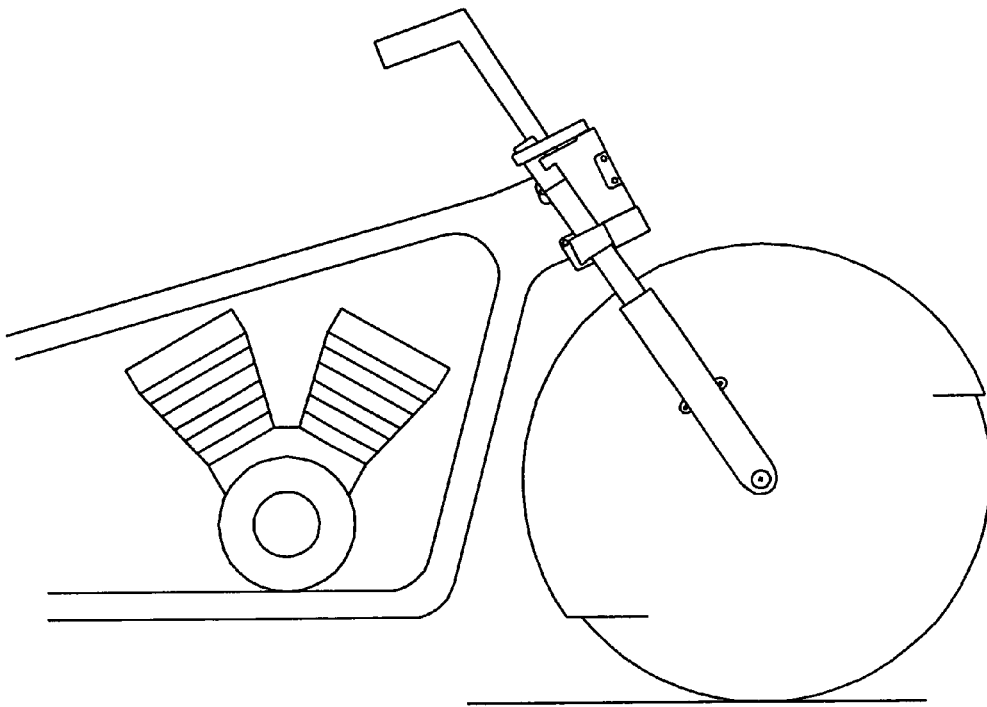


Fig. 8

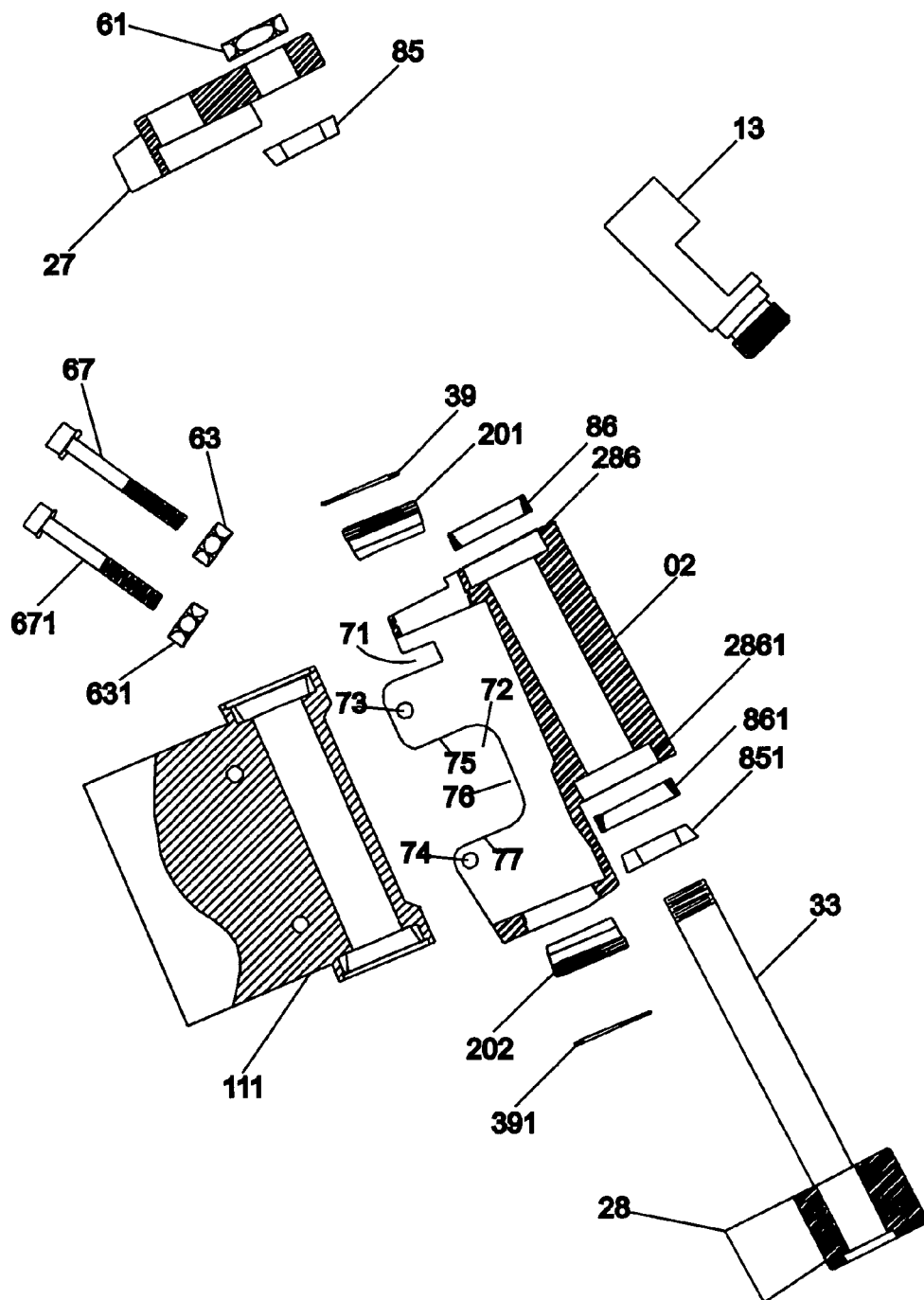


Fig. 9

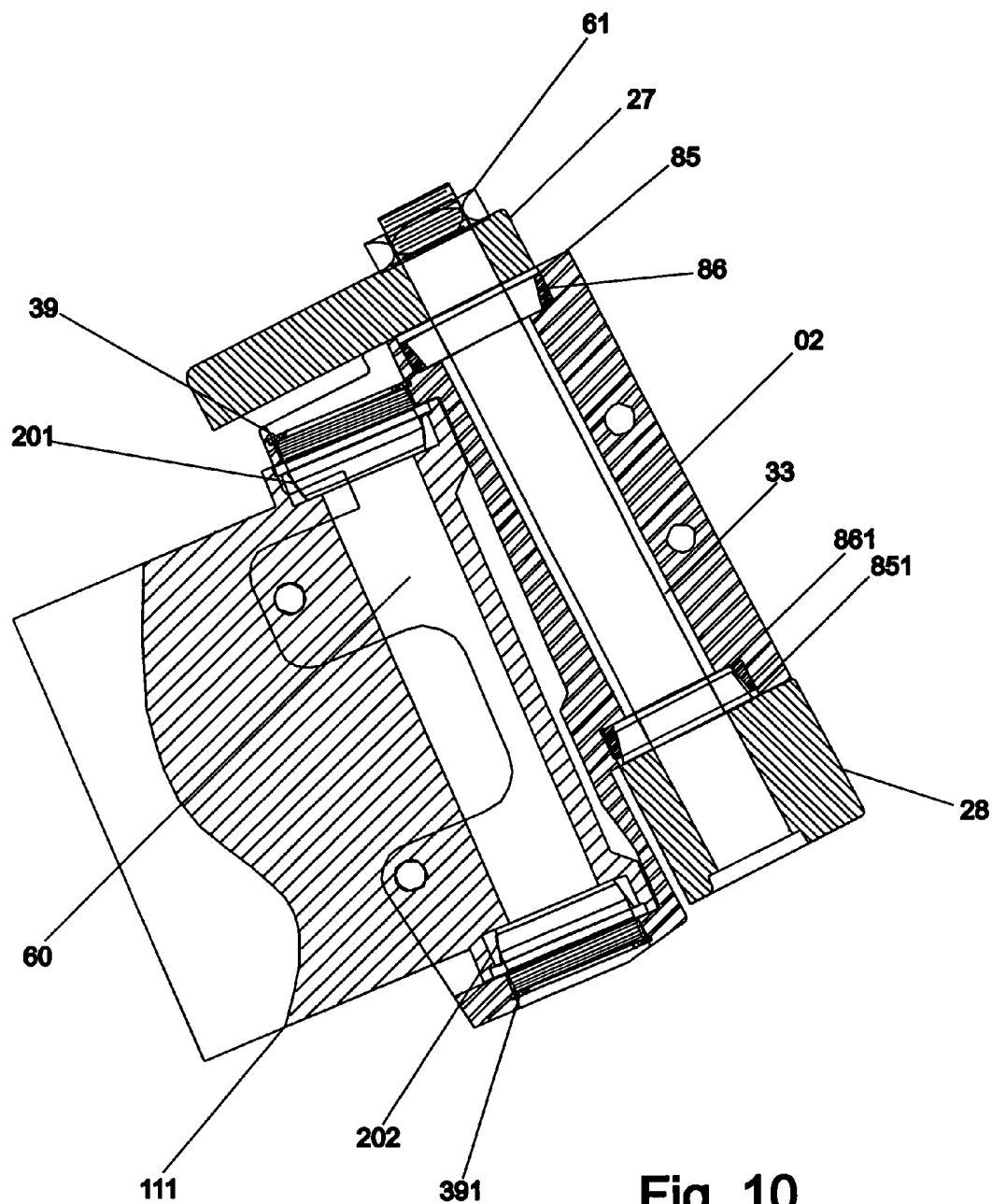


Fig. 10

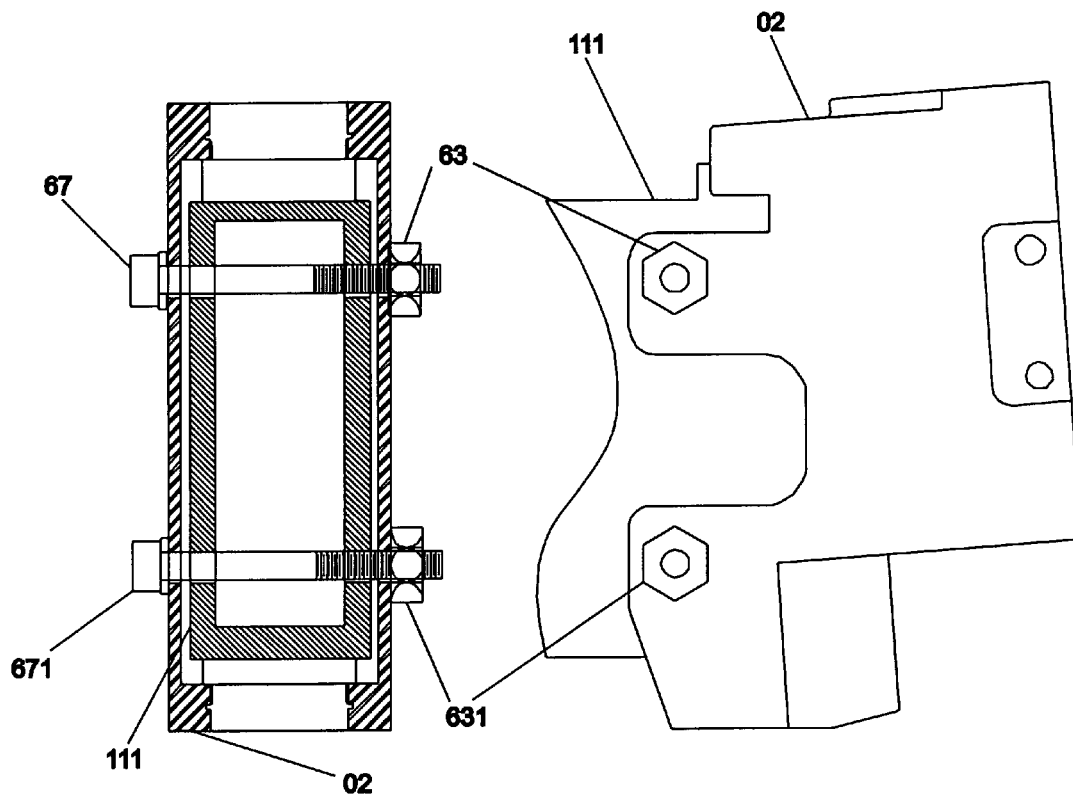


Fig. 11

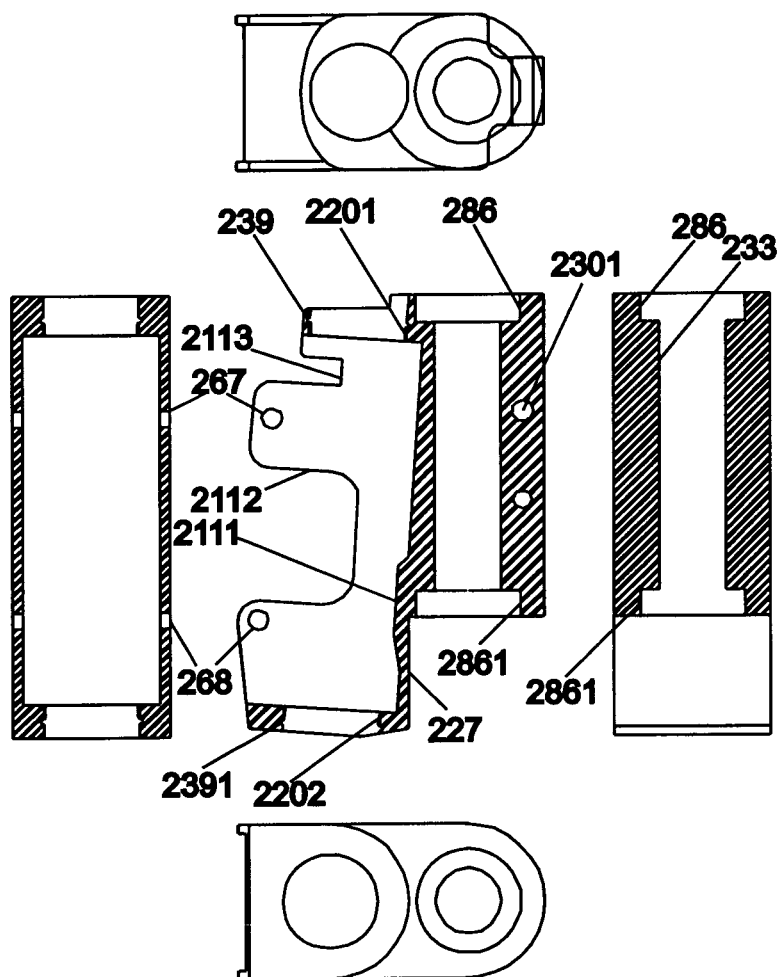


Fig. 12

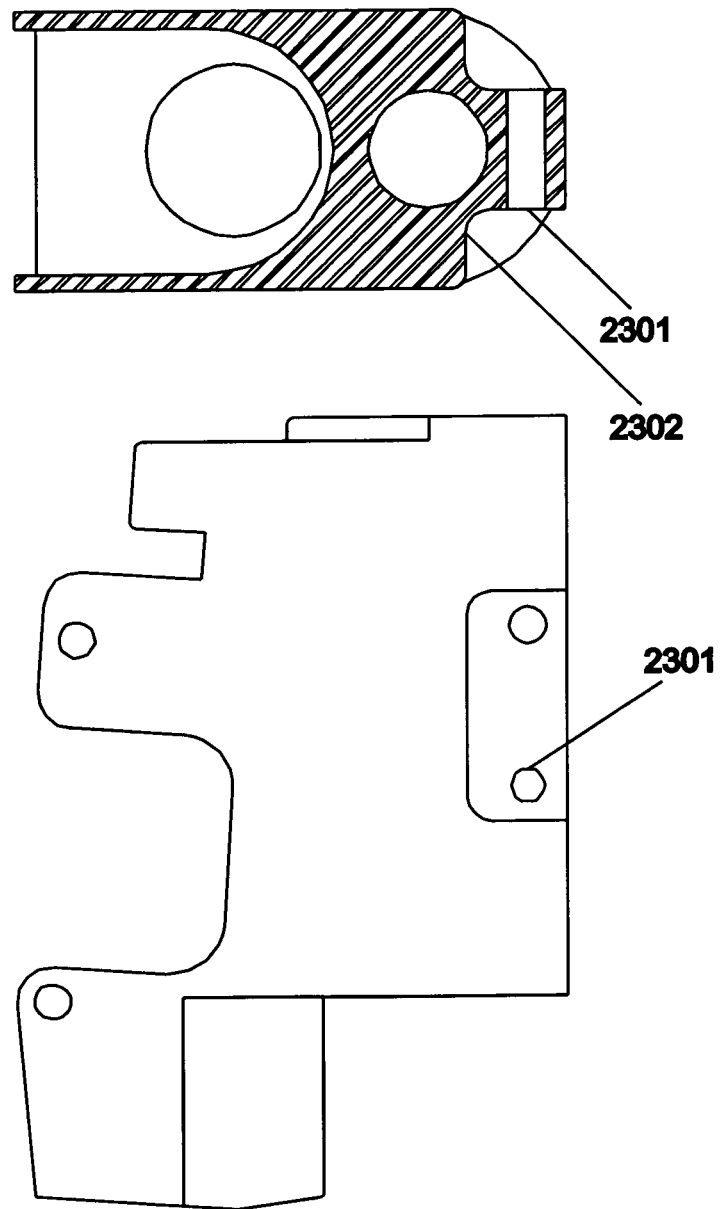


Fig. 13

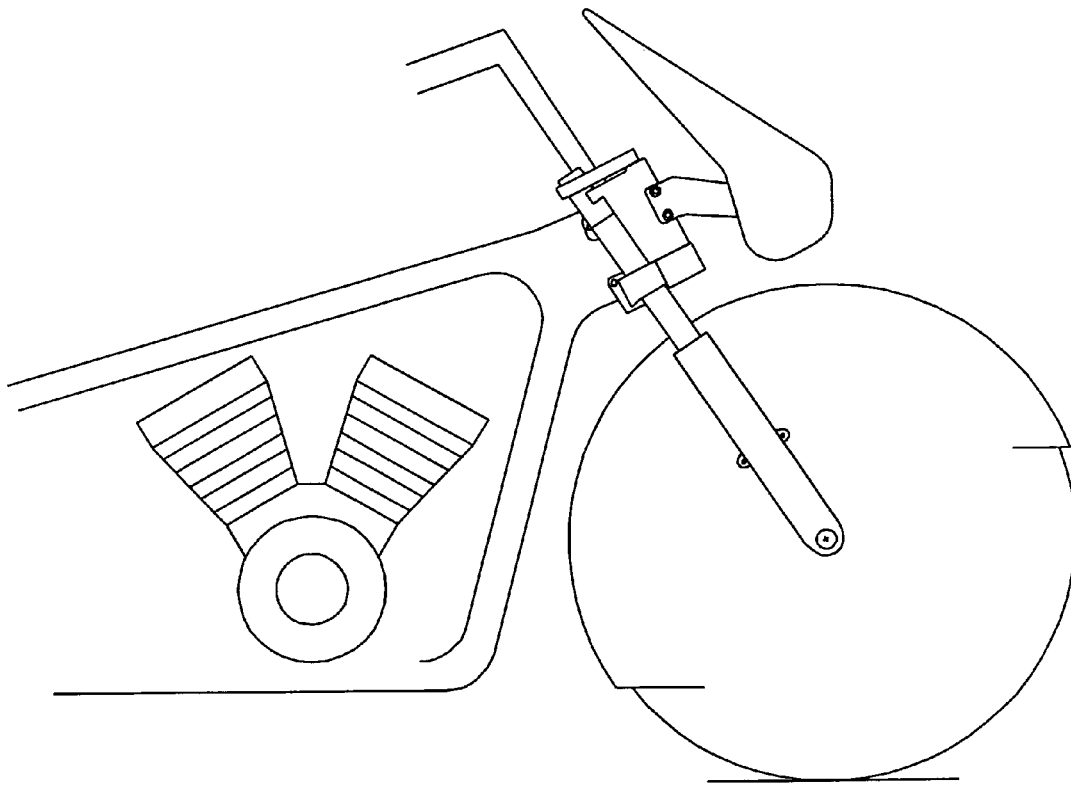


Fig. 14

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**MOTORCYCLE FORK ADAPTER**

This application is a non-provisional application of and claims priority from U.S. provisional application 62/037,008 by inventor Vince Costa filed Aug. 13, 2014 entitled Motorcycle Fork Adapter, the disclosure of which is incorporated herein by reference.

**FIELD OF THE INVENTION**

The present invention is in the field of motorcycle fork adapters.

**DISCUSSION OF RELATED ART**

When customizing a motorcycle front end, the front fork rake angle and other metrics need to be modified to receive a new motorcycle fork. In particular, when adapting to a larger front wheel clearance geometry require moving the neck upwards to clear the wheel. A variety of different motor cycle fork extensions have been implemented, such as U.S. Pat. No. 3,556,557 entitled Motorcycle Fork Extension by inventor R. E. Blair III patented Jan. 19, 1971, the disclosure of which is incorporated herein by reference. Inventor Dehnisch in U.S. Pat. No. 4,565,384 issued Jan. 21, 1986 entitled Motorcycle Fork Tree teaches an adjustable motorcycle fork tree. Additionally, Mrdeza in U.S. Pat. No. 7,438,306 issued Oct. 21, 2008, entitled Motorcycle Rake And Trail Adjuster, the disclosure of which is incorporated herein by reference, provides a motorcycle fork rake extension kit with a securing bolt for clamping the extension portion to the stock portion. The Mrdeza reference requires two separate plates to be clamped to the frame by a through bolt.

A common problem with the prior art bolt on neck rake altering systems is that they lack adequate structural strength. This lack of structural strength has led many within the motorcycle community to avoid these bolt on kits. Instead they would rather go through the tedious and time consuming process of cutting the neck off and welding a new one in place.

**SUMMARY OF THE INVENTION**

A motorcycle neck adapter comprising a main body formed of a single piece of metal, and a cavity socket formed on an aft end of the main body. The cavity socket is configured to receive an existing motorcycle neck. An upper set screw opening is formed on a top surface of the main body. An upper set screw is installed into the upper set screw opening. The upper set screw is configured to engage an existing motorcycle neck at an existing motorcycle steering neck top opening. The upper set screw is secured to the upper set screw opening by a threaded connection. A lower set screw opening is formed on a bottom surface of the main body. A lower set screw is installed into the lower set screw opening. The lower set screw is configured to engage an existing motorcycle neck at an existing motorcycle steering neck bottom opening. The lower set screw is secured to the lower set screw opening by a threaded connection. An upper bearing mount is formed on the top surface of the main body for receiving an upper tree and a lower bearing mount formed on the bottom surface of the main body for receiving a lower tree in a triple tree configuration.

The one piece construction is possible because the use of set screws to push against the stock neck, as opposed to a central bolt that clamps the neck together. This allows for a very rigid connection.

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Optionally, the motorcycle neck adapter can also include a pair of side bolt holes formed through a main body left side and a main body right side of the motorcycle neck adapter to secure the motorcycle neck adapter to an existing motorcycle frame. An upper circlip can be installed into a circlip groove upper formed on the upper set screw opening to retain the upper set screw and a lower circlip can be installed into a circlip groove lower formed on the lower set screw opening to retain the lower set screw. The upper set screw can be recessed into the upper set screw opening, and the lower set screw can be recessed into the lower set screw opening. A steering lock boss can be formed on the main body. A fairing mount can be formed on a front portion of the main body. The frame lock opening can be formed as a first slot. An outer frame opening formed as a second slot.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a diagram of a stock motorcycle before alteration.

FIG. 2 is a disassembly diagram of removal of trees forks and wheel from a stock motorcycle.

FIG. 3 is an assembly diagram showing a new neck adapter ready to slide in place.

FIG. 4 is an installation diagram showing the installation of the adapter to the stock neck and securing with set screws.

FIG. 5 shows the new neck installed.

FIG. 6 shows an exploded view of the installed new neck.

FIG. 7 is a cross-section diagram of the installed new neck.

FIG. 8 is a diagram showing a wheel and fork leg installed in trees on the new neck.

FIG. 9 shows the exploded view of diagram of the preferred embodiment.

FIG. 10 is an assembled view of the present embodiment in cross-section.

FIG. 11 shows the installation locations of the security bolts.

FIG. 12 shows a top, bottom, left, right and cross-section view of the new neck.

FIG. 13 shows a fairing mount top view and fairing mount side view.

FIG. 14 shows a fairing mounted to the fairing mount.

The following call out list of elements can be a useful guide in referencing the elements of the drawings.

**111** Standard Motorcycle Steering Neck

**2** Neck Adapter

**13** Body Cap

**33** Steering Stem

**28** Lower Triple Tree

**27** Upper Triple Tree

**39** Circlip Upper

**63** Lock Nut

**67** Side Mount Bolt

**71** First Slot

**72** Second Slot

**73** Upper Side Mount Bolt Opening (Side Bolthole)

**74** Lower Side Mount Bolt Opening (Side Bolthole)

**75** Upper Edge

**76** Front Edge

**77** Lower Edge

**85** Upper Bearing

**86** Bearing Race Upper

**101** Upper Steering Neck Socket

**102** Lower Steering Neck Socket

**201** Upper Set Screw

**202** Lower Set Screw

**61** Top Nut

**631** Side Mount Bolt



**671** Side Mount Nut  
**851** Lower Bearing  
**861** Lower Bearing Race  
**391** Lower Circlip  
**239** Circlip Groove Upper  
**267** Side Bolt Hole  
**268** Additional Side Bolt Hole  
**227** Opening For Lower Tree  
**233** Opening For Steering Tube  
**286** Opening For Upper Bearing Race (Upper Bearing Mount)  
**2111** Stock Neck Opening (Cavity Socket)  
**2112** Outer Frame Stock Bike Opening  
**2113** Frame Lock Opening  
**2201** Upper Set Screw Socket (Upper Set Screw Opening)  
**2202** Lower Set Screw Socket (Lower Set Screw Opening)  
**2391** Lower Circlip Opening  
**2201** Upper Set Screw Thread  
**2301** Fairing Mount  
**2302** Fairing Mount Hole  
**2861** Lower Bearing Opening (Lower Bearing Mount)

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A standard motorcycle typically has a front wheel and a rear wheel. The front wheel is retained to the motorcycle by the front fork. The steering neck **111** of the motorcycle in turn retains the front fork assembly. The neck needs to be modified so that a new fork tree can be implemented. The position of the fork is modified by the present invention by a neck adapter that moves the position of the fork assembly from the old steering neck location to a new location. The stock motorcycle typically has a steering axis that has a forward angle. The first step for modifying the stock motorcycle is to remove the trees, steering bearing, fork and wheel from the stock motorcycle. As shown in FIG. 2. The new neck adapter **2** is then installed to the stock neck **111**, as shown in FIG. 3. The neck adapter **2** is secured with set screws **201** and **202**. The set screws are installed into the old steering head, as shown in FIGS. 4 and 5.

The upper set screw **201** fits into the upper steering neck socket **101** of the stock motorcycle neck **111**. The lower set screw **202** fits into the lower steering neck socket **102** of the stock motorcycle. The neck adapter **2** has a slot that allows it to fit onto the stock motorcycle frame. **2111**

The neck adapter **2** is preferably a single block of aluminum billet that has been cut to form a main body of the neck adapter. By forming the neck adapter from a single structure, the possibility of misalignment is greatly reduced. The main body of the neck adapter has a steering tube **233** with a new upper fork bearing race socket **286** and a new lower bearing race socket **2861**. After the adapter is fitted over the neck, and the set screws **201** and **202** are secured into place, the top nut (**61**) secures the steering stem **33** and upper triple tree of the new fork and the upper bearing **85** is retained within an upper bearing race **86** such that the upper bearing **85** and the upper bearing race **86** is installed into the new upper neck socket **286**. Similarly, the new lower neck socket **2861** receives a lower bearing race **861** which retains a lower bearing **851**. The steering stem **33** connects the lower triple tree **28** to the upper triple tree **27**. The steering stem **33** has an upper end that is ready to receive the top nut **61**, as shown in FIG. 6.

The neck adapter **2** also has a first slot **71** and second slot **72** cut horizontally across the body of the neck adapter. The neck adapter can be cut from billet aluminum. The first slot **71** can be formed as an outer frame stock bike opening **2112**, and the

second slot **72** can be formed as a frame lock opening **2113**. Alternatively, the first slot **71** can be formed as the frame lock opening **2113**, and the second slot **72** can be formed as an outer frame stock bike opening **2112**.

The upper set screw socket **2201** and lower set screw socket **2202** preferably include circumferential grooves (**239** and **2391**) to respectively receive an upper circlip **39** and a lower circlip **391**. These circlips prevent vibration driven or accidental backing out of the set screws.

One or more side mount bolts may be used to further secure the assembly to the motorcycle frame. The first side mount bolt **67** is retained by the first lock nut **63** and the second side mount bolt **671** is retained by the second lock nut **631**. The first side mount bolt **67**, and the second side mount bolt **671** respectively fit into the first side mount bolt opening **267** and the second side mount bolt opening **268**. The stock motorcycle frame may have openings that the first side mount bolt **67** and the second side mount bolt **671** can be mounted to. The upper side mount bolt **73** can be formed as the first mount bolt opening **267** and the lower side mount bolt **74** can be formed as second side mount bolt opening **268**.

The second side mount bolt opening **268** is below the second slot **72**. The second slot **72** has an upper edge **75**, a front edge **76**, and a lower edge **77**. The second side mount bolt opening **268** is preferably the same size as the first side mount bolt opening **267**. The second slot **72** is preferably cut into the body of the neck adapter up to at least the old axis of rotation when seen from a side view such as in FIG. 10. The upper set screw and the lower set screw can be formed as socket caps for capping the old upper and lower sockets. The upper and lower set screws can be retained by circlips.

The neck adapter (**2**) has an opening to fit the stock neck of the motorcycle **111**. This opening which can be called the stock neck opening **2111**. The unit may also have an outer frame opening **2112** which can be formed as the second slot. Similarly, the frame lock opening **2113** formed on the new neck can also be formed as an additional slot which can be a first slot. The lower bearing opening **2861** opposes the upper bearing opening **286**. Clearance for the lower triple tree **28** may be provided by forming the neck adapter at **227**. The position and shapes of the openings **2111**, **2112**, **2113** are dictated by the shape of the stock motorcycle neck. The openings allow the neck adapter to be easily mounted to the standard motorcycle. Different motorcycles may require different openings to allow fitment of the neck adapter **2**.

The fairing mount **2302** has one or more a fairing mount holes **2301** for mounting the fairing to the fairing mount. The fairing mount **2302** is integrally formed with the steering tube. The fairing mount **2301** can be integrally formed with the steering tube.

The neck adapter **2** is preferably made of a single piece cut from billet aluminum and then held in place by the two large set screws **201** and **202**. Interior curves can be formed on the inside portion of the neck adapter **2** so that the alternate interior curves match the neck. The set screws **201** and **202**, fit into the bearing race so that the stock bearings need not be removed. The neck adapter **2** alters the position of the neck to increase or decrease rake, or to move the neck up or down, or to move the neck forward. The neck adapter **2** may accomplish any one or a several of these alterations to the position of the neck. The circlips prevent the complete extraction or dislodgment of the set screws **201** and **202**. Additional stability is provided by the side bolts that tie into the frame. A cavity is formed on the aft end of the one-piece neck adapter **2**. The cavity has a shape that is contoured to engage the neck of a stock motorcycle.

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The invention claimed is:

1. A motorcycle neck adapter comprising:

- a. a main body formed of a single piece of metal;
- b. a cavity socket formed on an aft end of the main body, wherein the cavity socket is configured to receive an existing motorcycle neck;
- c. an upper set screw opening formed on a top surface of the main body;
- d. an upper set screw installed into the upper set screw opening, wherein the upper set screw is configured to engage an existing motorcycle neck at an existing motorcycle steering neck bottom opening, wherein the upper set screw is secured to the upper set screw opening by a threaded connection;
- e. a lower set screw opening formed on a bottom surface of the main body;
- f. a lower set screw installed into the lower set screw opening, wherein the lower set screw is configured to engage an existing motorcycle neck at an existing motorcycle steering neck top opening, wherein the lower set screw is secured to the lower set screw opening by a threaded connection;
- g. an upper bearing mount formed on the top surface of the main body for receiving an upper tree and a lower bearing mount formed on the bottom surface of the main body for receiving a lower tree in a triple tree configuration.

2. The motorcycle neck adapter of claim 1, wherein a one or more side boltholes are formed through a main body left side and a main body right side of the motorcycle neck adapter to secure the motorcycle neck adapter to an existing motorcycle frame.

3. The motorcycle neck adapter of claim 1, wherein an upper circlip is installed into a circlip groove upper formed on the upper set screw opening to retain the upper set screw and

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wherein a lower circlip is installed into a circlip groove lower formed on the lower set screw opening to retain the lower set screw.

4. The motorcycle neck adapter of claim 1, wherein the upper set screw is recessed into the upper set screw opening, and wherein the lower set screw is recessed into the lower set screw opening.

5. The motorcycle neck adapter of claim 1, further comprising a steering lock boss formed on the main body.

6. The motorcycle neck adapter of claim 1, further comprising a fairing mount formed on a front portion of the main body.

7. The motorcycle neck adapter of claim 1, further comprising a frame lock opening formed as a first slot.

8. The motorcycle neck adapter of claim 7, further comprising an outer frame opening formed as a second slot.

9. The motorcycle neck adapter of claim 8, wherein a one or more side boltholes are formed through a main body left side and a main body right side of the motorcycle neck adapter to secure the motorcycle neck adapter to an existing motorcycle frame.

10. The motorcycle neck adapter of claim 8, wherein an upper circlip is installed into a circlip groove upper formed on the upper set screw opening to retain the upper set screw and wherein a lower circlip is installed into a circlip groove lower formed on the lower set screw opening to retain the lower set screw.

11. The motorcycle neck adapter of claim 8, wherein the upper set screw is recessed into the upper set screw opening, and wherein the lower set screw is recessed into the lower set screw opening.

12. The motorcycle neck adapter of claim 8, further comprising a steering lock boss formed on the main body.

13. The motorcycle neck adapter of claim 8, further comprising a fairing mount formed on a front portion of the main body.

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